OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: Clean Air Carolina

Address: PO Box 5311

City: Charlotte

State: NC: North Carolina Zip Code: 28299

B. DUNS No. 078680184

II. Is the applicant currently receiving EPA Assistance? ☐ Yes ☒ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

N/A

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

N/A

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

N/A

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☐ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

N/A

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95)	☒ Yes	☐ No
a. Do the methods of notice accommodate those with impaired vision or hearing?	☒ Yes	☐ No
b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?	☒ Yes	☐ No
c. Does the notice identify a designated civil rights coordinator?	☐ Yes	☒ No
VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))	☒ Yes	☐ No
IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)	☐ Yes	☒ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

N/A

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.

N/A

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
Kerstan Ryan	Philanthropy Manager	03/25/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: Ms. First Name: Kerstan Middle Name:
Last Name: Ryan Suffix:

Title: Philanthropy Manager

Complete Address:

Street1: PO Box 5311
Street2:
City: Charlotte State: NC: North Carolina
Zip / Postal Code: 28299-5311 Country: USA: UNITED STATES

Phone Number: 704-307-9528, ext. 110 **Fax Number:**

E-mail Address: kerstan@cleanairenc.org

Payee: *Individual authorized to accept payments.*

Name: Prefix: Mr. First Name: Gerald Middle Name:
Last Name: Babao Suffix:

Title: Deputy Director

Complete Address:

Street1: PO Box 5311
Street2:
City: Charlotte State: NC: North Carolina
Zip / Postal Code: 28299-5311 Country: USA: UNITED STATES

Phone Number: 704-307-9528, ext. 102 **Fax Number:**

E-mail Address: gerald@cleanairenc.org

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: Mr. First Name: Gerald Middle Name:
Last Name: Babao Suffix:

Title: Deputy Director

Complete Address:

Street1: PO Box 5311
Street2:
City: Charlotte State: NC: North Carolina
Zip / Postal Code: 28299-5311 Country: USA: UNITED STATES

Phone Number: 704-307-9528, ext. 102 **Fax Number:**

E-mail Address: gerald@cleanairenc.org

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: Prefix: Ms. First Name: Denise Middle Name:

Last Name: Bruce Suffix:

Title: Citizen Science Manager

Complete Address:

Street1: PO Box 5311

Street2:

City: Charlotte State: NC: North Carolina

Zip / Postal Code: 28299-5311 Country: USA: UNITED STATES

Phone Number: 704-307-9528, ext. 107 **Fax Number:**

E-mail Address: denise@cleanairenc.org

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Sampson County Air Monitoring Network	66.034	$	$	$ 500,000.00	$	$ 500,000.00
2.						
3.						
4.						
5. Totals		$	$	$ 500,000.00	$	$ 500,000.00

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1)	(2)	(3)	(4)	(5)
	Sampson County Air Monitoring Network				
a. Personnel	$ 318,200.00	$	$	$	$ 318,200.00
b. Fringe Benefits	0.00				0.00
c. Travel	10,000.00				10,000.00
d. Equipment	16,891.00				16,891.00
e. Supplies	4,000.00				4,000.00
f. Contractual	90,000.00				90,000.00
g. Construction	0.00				0.00
h. Other	39,000.00				39,000.00
i. Total Direct Charges (sum of 6a-6h)	478,091.00				$ 478,091.00
j. Indirect Charges	21,909.00				$ 21,909.00
k. TOTALS (sum of 6i and 6j)	$ 500,000.00	$	$	$	$ 500,000.00
7. Program Income	$ 0.00	$	$	$	$ 0.00

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Z. Smith Reynolds Foundation	$ 0.00	$	$ 20,000.00	$ 20,000.00
9. Fred and Alice Stanback Foundation	0.00		50,000.00	50,000.00
10.				
11.				
12. TOTAL (sum of lines 8-11)	$ 0.00	$	$ 70,000.00	$ 70,000.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$	$	$	$	$
14. Non-Federal	$				
15. TOTAL (sum of lines 13 and 14)	$	$	$	$	$

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. Sampson County Air Monitoring Network	$ 177,594.00	$ 176,703.00	$ 145,703.00	$ 0.00
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 177,594.00	$ 176,703.00	$ 145,703.00	$ 0.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges: based on EPA direct cost guidelines

23. Remarks: Clean Air Carolina has been selected as a 2021 EPA EJ Small Grants finalist. We have not yet been provided with a final award letter or start date.

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/25/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Clean Air Carolina

* b. Employer/Taxpayer Identification Number (EIN/TIN): 57-0462653

* c. Organizational DUNS: 0786801840000

d. Address:

* Street1: PO Box 5311

Street2:

* City: Charlotte

County/Parish:

* State: NC: North Carolina

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: 28999-5311

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Ms.

* First Name: Kerstan

Middle Name:

* Last Name: Ryan

Suffix:

Title: Philanthropy Manager

Organizational Affiliation: Employee

* Telephone Number: 704-307-9528, ext. 110

Fax Number:

* Email: kerstan@cleanairenc.org

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Sampson County Air Monitoring Network

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 12 * b. Program/Project: 7

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 01/01/2023 * b. End Date: 12/31/2025

18. Estimated Funding ($):

* a. Federal	500,000.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	70,000.00
* f. Program Income	0.00
* g. TOTAL	570,000.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Ms. * First Name: Kerstan

Middle Name:

* Last Name: Ryan

Suffix:

* Title: Philanthropy Manager

* Telephone Number: 704-307-9528, ext. 110 Fax Number:

* Email: kerstan@cleanairenc.org

* Signature of Authorized Representative: Kerstan Ryan * Date Signed: 03/25/2022

Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1235-Quality Assurance Statement.pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1234-Project Narrative.docx.pdf

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

Denise Bruce

Ex. 6 Personal Privacy (PP)

Work Experience

CleanAIRE NC | Research Triangle Park, NC
Citizen Science Manager ***February 2022- Present***

- Manage the AirKeepers program—a network of 100 volunteer scientists who monitor air quality (PM2.5) in North Carolina—with PurpleAir sensors.
- Coordinate the Citizen Science Advisory Board, compromised technical experts on air monitoring technology, citizen science engagement, and GIS and mapping expertise.
- Maintain a statewide network of diverse organizational partners, public agencies, and individuals with special emphasis on creating micro-networks in environmental justice communities.
- Provide technical support, resources, and data for researchers, policymakers, health professionals, and K-12 educators.

NC Division of Air Quality| Fayetteville Regional Office, NC
Environmental Specialist ***February 2020 - February 2022***

- Developed and maintained current partnerships with public schools and local advocacy organizations to promote Air Quality Awareness.
- Collaborated with NC Air Awareness Staff to create new digital presentations for public schools and community organizations.
- Analyzed and interpreted North Carolina Air Quality Rules for the purposes of compliance work and worked with diverse groups of business owners and managers for regulatory compliance.
- Completed 100% of assigned inspections during the 2020-2021 calendar year.

Sustainable Sandhills | Fayetteville, NC
Environmental Program Manager ***July 2014 - February 2020***

- Spearheaded the planning committee for Sandhills Clean Energy Summit and 2019 National Drive Electric Event, Fayetteville, including identifying the venue, developing the agenda, coordinating the speakers, arranging the caterer, organizing volunteers, and the technical team.
- Analyzed, synthesized, and disseminated new research regarding the health impacts of air pollution and climate change by creating position statements for the Air Quality Stakeholders of Cumberland County.
- Worked with Sustainable Sandhills editorial staff to pen op-eds in support of advocacy activities from a sustainability and environmental health perspective.
- Created Air Awareness and Heat Vulnerability content for social media and blog posts.
- Supervised interns that contributed to future program development and program support.

ABB Inc. | Raleigh, NC
Health and Safety Administrator ***September 2011 – March 2012***

- Managed the Power Systems of North America (PS-NAM) Raleigh Safety Team, including writing the agenda and scheduling the board's monthly meetings and creating safety awareness content for internal dissemination across all PS-NAM worksites.
- Analyzed, synthesized, and disseminated new research on workplace safety to the PS-NAM Safety Team and led the planning and coordination of on-site safety training, including scheduling the venue and training professionals.
- Led the planning and coordinated the logistics for the PS-NAM Safety Team annual team building, including coordinating with the caterer, venue reservations, and finding office space for the team while on-site at PS-NAM Raleigh.

Denise Bruce

Ex. 6 Personal Privacy (PP)

Conference Presentations

2019 Annual Symposim
Center for Human Health and the Environment
Mold Busters Poster Presentation

2018 EPA National Air Quality Conference
Cumberland County Schools Carbon Bank
Conference Presenter and Poster Presentation

Education

East Carolina University, Greenville, NC ***Fall 2021-Present***

- M.S. Data Science

Fayetteville Technical Community College , Fayetteville, NC ***Fall 2016- Fall 2019***

- Associate Certificate Java and Database Programming

East Carolina University, Greenville, NC ***Fall 2003- Fall 2010***

- B.S. Environmental Health

Daisha Williams

Environmental Justice Program Manager

Passionate advocate bringing a wide variety of professional knowledge and world experience to the field of environmental policy and justice in order to approach environmental equity challenges from many different perspectives.

Work History

2021-07 - Current

Environmental Justice Program Manager

CleanAIRE NC, Charlotte, NC

· Aid in community understanding of air pollution, health impacts, environmental regulation, and data to pursue meaningful community led solutions towards reducing environmental harm.

· Engage creatively and strategically across the NC regulatory landscape to bring EJ issues to the forefront and into consideration.

· Oversee the development and implementation of CleanAIRE NC's Equitable Air Permitting Campaign engaging environmental justice communities, health leaders, and other advocates to address serious health concerns around cumulative impacts of pollution.

2020-01 - 2021-06

Regional Stormwater Specialist and Educator

Conservation Trust for North Carolina, Charlotte, NC

- Coordinated with Johnson C. Smith University to assist with the following tasks associated with the Our Voice Our Water grant with the focus of involving underserved communities in municipal stormwater program goals: conducted stream assessments in project neighborhoods, analyzed and created GIS data related to community stormwater concerns, collected and analyzed data on pollution reporting in the community from 3-1-1 city calls, created citizens surveys, created a website as a hub for community participants (ourvoiceourwater.com),

Contact

Address

Charlotte, NC, 28204

Ex. 6 Personal Privacy (PP)

Skills

Critical and analytical thinker

●●●●● Excellent

Strong attention to detail

●●●●○ Very Good

Leader and team player

●●●●● Excellent

Strong communication skills

●●●●● Excellent

Geospatial concepts and GIS

●●●○○ Good

created modules surrounding stormwater education, and assisted with community events and focus groups
- Assisted all 23 municipalities in the partnership in reaching their stormwater permit requirements and compliance under the National Pollutant Discharge Elimination system.

2019-01 - 2019-06

Legislative Assistant

Washington Environmental Council, Seattle, WA

- Followed the policy-making process in Washington state to effectively cover policy decisions and create a policy strategy for the 2019 legislative session
- Assisted legislative staff to conduct research and analysis in multiple policy areas to include NEPA, SEPA, and the Clean Water and Clean Air Acts
- Created and conducted workshops within Seattle Title I schools to empower students with the knowledge of our legislative processes and connected them with their local legislators
- Attended and helped with turn outs to town hall meetings and Environmental Lobby Day at the capitol.

Education

2019-05 - 2020-12

Master of Science: Environmental Sciences and Policy

Johns Hopkins University - Baltimore, Maryland

2014-01 - 2018-01

Bachelor of Science: Sustainable Development And Environmental Science

Appalachian State University - Boone, NC

2020-08 - 2021-12

Graduate Certificate: Geographic Information Sciences And Technology

University of North Carolina - Charlotte, NC

SHERRI WHITE-WILLIAMSON

Ex. 6 Personal Privacy (PP)

EDUCATION

Vermont Law School, South Royalton, VT
Juris Doctor, May 2018
Master of Energy Regulation and Law, May 2018
Certificate in Experiential Advocacy (General Practice), May 2018

American University, Washington, DC
Master of Public Administration, Key Executive Leadership Program

Howard University, Washington, DC
B.S., Zoology with a Minor in Chemistry

PROFESSIONAL EXPERIENCE

Au Sable Institute
Adjunct Professor, July 2021 – August 2021
Teaching undergraduate and graduate level course in Environmental Justice exploring the relationship between faith and Christian responsibility.

Nicholas School of the Environment, Duke University, Durham, NC
Adjunct Professor, January 2020 – Present
Teaching a graduate-level Environmental Justice survey course exploring the history of environmental justice and its impact on low-income communities and communities of color.

North Carolina Conservation Network. Raleigh, NC
Environmental Justice Policy Director, August 2020 – Present
Working with leadership of the NCCN to develop policy and build strategic partnerships to assure that voices from impacted communities are included in policy considerations.

Environmental Justice Coordinator, November 2019 – July 2020
Strengthened strategic partnerships, built new partnerships with community advocates, and organizations and leaders from more rural areas of the state not traditionally included in advocacy efforts.

Southern Environmental Law Center, Chapel Hill, NC
Legal Intern, January 2018 – April 2018

Center on Race, Poverty and the Environment, Oakland, CA/Delano, CA
Legal Intern, June 2017 – August 2017

Vermont Law School, Institute for Energy and the Environment, South Royalton, VT
Research Associate/Student Clinician, June 2016 – May 2017

Ex. 6 Personal Privacy (PP)

U.S. Environmental Protection Agency, Office of Children's Health Protection.
Washington, DC
Program Analyst, June 2015 – August 2015 (Detail)

U.S. Environmental Protection Agency, Office of Environmental Justice, Washington, DC
Designated Federal Officer, National Environmental Justice Advisory Council (NEJAC).
May 2015 – June 2015

U.S. Environmental Protection Agency, Office of Environmental Justice, Washington, DC
Program Manager
Interagency Working Group on Environmental Justice
April 2011 – May 2014

U.S. Environmental Protection Agency, Office of Environmental Justice, Washington, DC
Special Assistant to the Senior Advisor to the Administrator, September 2010 – April 2011

U. S. Environmental Protection Agency, Office of Radiation and Indoor Air, Washington, DC
Program Analyst, September 2004 – August 2010

American University, Washington, DC
Adjunct Professor, May 2006 – August 2008

American Cancer Society (ACS), Washington, DC
Manager, Federal Government Relations, April 2001 – September 2004

U.S. Department of Agriculture, Office of Civil Rights, Washington, DC
Manager, Intake Division, April 1999 – January 2001

HONORS AND AWARDS

- Marc Mihaly Environmental Leadership Award: 2018
- Environmental Law Conference at Yosemite – Remy Scholarship: 2017
- Fellow, Joan Loring Chapter, Inns of Court: 2017-2018
- Equal Justice Foundation Scholarship: 2017
- Wall Scholar: 2016-2018
- Environmental Mission Scholar: 2015-2018
- Bronze Medal – Revitalization of the Interagency Working Group on Environmental Justice Team: 2013
- Outstanding Team Award for Gulf Coast Oil Spill Emergency Response: 2010
- Certificate of Appreciation, Regional Indoor Air Programs: 2010
- Suzanne E. Olive Exemplary Leadership Award in Equal Employment Opportunity 2008, 2009

Biographical Sketch – Brian I. Magi

University of North Carolina at Charlotte, Charlotte, North Carolina
Contact: Ex. 6 Personal Privacy (PP)

(a) Professional Preparation

University at Arizona	Physics and Applied Math	B.S., 1998
University of Washington	Atmospheric Sciences	Ph.D., 2006
Princeton University	Climate/Atmospheric Model Evaluation	2007-2011

(b) Appointments

2017-present Associate Professor of Atmospheric Sciences, Geography and Earth Sciences Department, University of North Carolina at Charlotte

2011-2017 Assistant Professor of Atmospheric Sciences, Geography and Earth Sciences Department, University of North Carolina at Charlotte

2007-2011 Postdoctoral Research Associate, Princeton University

(c) Peer-Reviewed Publications (Selected)

1. Webb, E.J. and **B. I. Magi**, 2022: The Ensemble Oceanic Nino Index, *International Journal of Climatology*, https://doi.org/10.1002/joc.7535
2. Eppes, M. C., **B. Magi**, J. Scheff, K. Warren, S. Ching, and T. Feng, 2020: Warmer, wetter climates accelerate mechanical weathering in field data, independent of stress-loading. *Geophysical Research Letters*, https://doi.org/10.1029/2020GL089062
3. Schaefer, A. J., and **B. I. Magi**, 2019: Land-Cover Dependent Relationships between Fire and Soil Moisture. *Fire*, 2, 55, https://doi.org/10.3390/fire2040055
4. **Magi, B. I.**, C. Cupini, J. Francis, M. Green, and C. Hauser, 2019: Evaluation of PM2.5 measured in an urban setting using a low-cost optical particle counter and a Federal Equivalent Method Beta Attenuation Monitor. *Aerosol Science and Technology*, 1-13. https://doi.org/10.1080/02786826.2019.1619915
5. Rabin, S. S., D. S. Ward, S. L. Malyshev, **B. I. Magi**, E. Shevliakova, and S. W. Pacala (2018), A fire model with distinct crop, pasture, and non-agricultural burning: use of new data and a model-fitting algorithm for FINAL.1. *Geoscientific Model Development*, 11, 815-842, https://doi.org/10.5194/gmd-11-815-2018
6. van Marle, M. J. E., S. Kloster, **B. I. Magi**, J. R. Marlon, A. L. Daniau, R. D. Field, A. Arneth, M. Forrest, S. Hantson, N. M. Kehrwald, W. Knorr, G. Lasslop, F. Li, S. Mangeon, C. Yue, J. W. Kaiser, and G. R. van der Werf (2017), Historic global biomass burning emissions for CMIP6 (BB4CMIP) based on merging satellite observations with proxies and fire models (1750–2015). *Geoscientific Model Development*, 10, 3329-3357, https://doi.org/10.5194/gmd-10-3329-2017
7. **Magi, B.I.** (2009), Chemical apportionment of southern African aerosol mass and optical depth, *Atmospheric Chemistry and Physics*, https://acp.copernicus.org/articles/9/7643/2009/acp-9-7643-2009.html
8. **Magi, B.I.**, Q. Fu, and J. Redemann (2007), A methodology to retrieve self-consistent aerosol optical properties using common aircraft measurements, *Journal of Geophysical Research*, https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2006JD008312
9. **Magi, B.I.**, P.V. Hobbs, T.W. Kirchstetter, T. Novakov, D.A. Hegg, S. Gao, J. Redemann, and B. Schmid (2005), Aerosol Properties and Chemical Apportionment of Aerosol Optical Depth at

Locations off the United States East Coast in July and August 2001, *Journal of the Atmospheric Sciences*, https://journals.ametsoc.org/view/journals/atsc/62/4/jas3263.1.xml

10. Kirchstetter, T.W., T. Novakov, P.V. Hobbs, and **B. Magi** (2003), Airborne measurements of carbonaceous aerosols in southern Africa during the dry biomass burning season, *Journal of Geophysical Research*, https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2002JD002171

(d) Funding (Selected)

1. 2019-2020: AGU Centennial Grant "Airkeepers: Regional Citizen Science Networks", $8000 awarded to Clean Air Carolina (non-profit), none to UNC Charlotte
2. 2014-2018: Collaborative Research: Testing Hypotheses About Fire Using Data Syntheses and Fire Modeling, NSF Geography and Spatial Sciences (NSF Abstract)
3. 2015-2016: UNC Charlotte Faculty Research Grant (internal to UNC Charlotte)
4. 2014-2015: North Carolina Space Grant New Investigator Program

(e) Synergistic Activities (Selected)

1. 2021: Oommen, R., Cansler, J., Enoch, S., Faught, K., Greene, D., Mendenhall, S., Perez, H., Richman, T., Tisano, J., Sellers, J., Blotnick, J., Sharova, M., Babao, G., Cupini, C. & **Magi, B**. "Clean Air Carolina PurpleAir Sensor Network Assessment, 2017-2020"
2. 2020: M. Fliss, C. Cupini, S. Arunachalam, R. Dhingra, L. Engel, C. Heaney, **B. Magi**, S. Rhodes, A. Rule, Sacoby Wilson, C. Woods, W. Vizuete: Public Comment on "NC DEQ Industrial Hog Operation Air Quality Monitoring Study: Scientific Review of the Duplin County Air Monitoring Study"
3. 2015-present: Board of Directors of Clean Air Carolina (non-profit), Charlotte, NC
4. 2015-present: Mecklenburg County Air Quality Commission, Charlotte, NC
5. 2019-2021: Chair of Plenary Session titled "Climate Communication Through the Arts", Carolinas Climate Resilience Conference, https://www.cisa.sc.edu/ccrc/program.html
6. 2018-2019: Charlotte Teachers Institute at UNC Charlotte, Working with K-12 teachers to develop a curriculum unit related to Climate Science and Solution Strategies, https://charlotteteachers.org/seminars/2019-seminars/climate-science-and-solution-strategies/

(f) Teaching (Selected)

1. **Global Environmental Change**, ESCI 3101, 50 students, Overview: The Earth's climate, how scientific evidence shows that humans are largely responsible for current climate change, what we should expect on a warmer world, and solution strategies.
2. **Atmospheric Chemistry**, METR 4220 / ESCI 5220, 10 students, Overview: A study of the ozone layer and hole, and past and current driving factors in air quality.
3. **Statistics and Data Analysis in Earth Sciences**, METR 4122 / ESCI 5122, 20 students, Overview: Statistical methods to explore hypothesis-based questions in Earth sciences.
4. **Physical Meteorology**, METR 3220, 15 students, Overview: Atmospheric optics, cloud microphysics, atmospheric electricity, and sunlight in the atmosphere.

BIOGRAPHICAL SKETCH

NAME: Cho, Seung-Hyun	POSITION TITLE
INSTITUTION/ORGANIZATION RTI International	Principal Exposure Research Scientist

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Korea University, Sejong, South Korea	BA	02/1997	Env. Science/Engineering
Gwangju Institute of Science and Technology, Gwangju, South Korea	MS	02/1999	Env. Science/Engineering
University of Cincinnati, OH	PhD	09/2005	Environmental Health
U.S. Environmental Protection Agency, Research Triangle Park, NC	Postdoc.	10/2009	Exposure Science and Inhalation Toxicology

A. Summary of Professional Experience

Dr. Seung-Hyun Cho is a Principal Exposure Research Scientist in RTI International's Air Quality and Exposure (AQE) Program. During the past 15 years, Dr. Cho leads interdisciplinary studies to assess the linkages between air pollution exposures and adverse health outcomes with comprehensive source-emission-chemistry-transport-exposure-dose-response paradigm. Her research often integrates modeling, laboratory, and field studies to improve exposures assessment. Currently, Dr. Cho as PI of two grant projects for a U.S. Environmental Protection Agency (EPA) Science to Achieve Results (STAR) Program, leads citizen science effort in which individuals use low-cost sensors to measure air quality in their communities, indoor homes, and personal exposures to particulate matter (PM). She has been leading or involved in several other exposure-health effect studies to address health effects of air pollution exposures, supporting government research programs, including EPA, CDC, NIEHS, NHLBI, NICHD, FDA, and Korea Disease Control and Prevention Agency, and private clients such as Bill and Melinda Gates Foundation.

B. Positions

2010–date Principal Exposure Research Scientist, RTI International, RTP, NC, USA

C. Selected Honors and Awards

2010, 2012 Honorable Mention, EPA Scientific and Technological Achievement Awards

2008–2009 EPA Bronze Medal for Commendable Service Award, EPA's Annual Office of Research and Development Honor Award*

** Contributions were recognized for these EPA awards, but I was not eligible due to non-U.S. citizenship.*

D. Selected Peer-Reviewed Publications (representative sample from **36 peer-reviewed publications**)

Ye, W., Saikawa, E., Avramov, A., **Cho, S.-H.**, & Chartier, R. (2020). Household air pollution and personal exposure from burning firewood and yak dung in summer in the eastern Tibetan Plateau. *Environmental Pollution*, 263(Part B), 114531.

Park, J., Ryu, H., Kim, E., Choe, Y., Heo, J., Lee, J., **Cho, S.-H.**, Sung, K., Cho, M. and Yang, W. (2020). Assessment of $PM_{2.5}$ population exposure of a community using sensor-based air

monitoring instruments and similar time-activity groups. *Atmospheric Pollution Research, 11*(11), pp.1971-1981.

Cox, J., **Cho, S.-H.**, Ryan, P., Isiugo, K., Ross, J., Chillrud, S., et al. (2019). Combining sensor-based measurement and modeling of PM2.5 and black carbon in assessing exposure to indoor aerosols. *Aerosol Science and Technology, 53*(7), 817-829.

Ha, S., Nobles, C., Kanner, J., Sherman, S., **Cho, S.-H.**, … & Ouidir, M. (2019). Air pollution exposure monitoring among pregnant women with and without asthma. Annals of Epidemiology, 36, 71.

Cho, S-H., Chartier, R. T., Mortimer, K., Dherani, M., & Tafatatha, T. (2016). A personal particulate matter exposure monitor to support household air pollution exposure and health studies. In *2016 IEEE Global Humanitarian Technology Conference (GHTC)* (pp. 817–818).

Hays, M.D., **Cho, S-H.**, R. Baldauf, J.J. Schauer, and M. Shafer. (2011). Particle size distributions of metal and non-metal elements in an urban near-highway environment. *Atmospheric Environment 45*:925–934.

Cho, S-H., J.I. Yoo, A.T. Turley, C.A. Miller, W.P. Linak, J.O.L. Wendt, F.E. Huggins, and M.I. Gilmour. (2009). Relationships between composition and pulmonary toxicity of prototype particles from coal combustion and pyrolysis. In *Proceedings of the Combustion Institute 32*:2717–2725.

Cho, S-H., H. Tong, J. McGee, R. Baldauf, Q. Krantz, and M. Gilmour. (2009). Comparative toxicity of size-Fractionated airborne particulate matter collected at different distances from an urban highway. *Environmental Health Perspectives 117*(11):1682–1689.

E. Selected Research Support

EPA STAR 84024001 Wong-Parodi/Cho (PI) 09/2021 to 08/2024
This study is to understand the effectiveness of various technologies and behavior intervention approaches to reduce indoor exposures to wildfire smoke and adverse health risk for low-income communities.

NIEHS 1R21ES030142-01A1 Ryan/Cho (PI) 05/2020 to 04/2023
The grant's aim is to understand the link between children's ultrafine and fine PM exposures and asthma exacerbation, using high resolution data from portable air pollution sensors.

EPA STAR 83618701 Cicutto/Cho (PI) 05/2016 to 04/2023
The grant's aim is to understand how communities and individuals use low-cost sensors to collect, analyze, and interpret air quality data to address their concerns or support behavior changes to reduce air pollution exposures.

RTI Project 0218075 Song (Cho: RTI PI) 04/2021 to 12/2023
The study is to examine the link between indoor air quality measured by low-cost sensors and Interstitial lung disease in a Korean cohort. Funded by Korea Disease Control and Prevention Agency.

NHLBI 1P01HL132821-01A1 Voelker (PI) 09/2017 to 8/2023
The study is to understand nasal epithelial cell RNA expression of exacerbation prone asthmatics with different phenotypes for air pollution exposures. Role: Exposure data analyst

RTI Project 0215153 Multiple PIs 11/2015 to 12/2018
This Bill and Melinda Gates Foundation research program aims to measure the benefit of cookstove intervention on children's health in developing countries. Role: Exposure data analyst

Environmental Justice Community Action Network
EJCAN
SUPPORTING COMMUNITIES

March 22, 2022

June Blotnick
Executive Director
CleanAIRE NC
933 Louise Avenue #499
Charlotte, NC 28204

RE: Enhanced Air Quality Monitoring for Communities
RFA NUMBER: EPA-OAR-OAQPS-22-01

Dear Ms. Blotnick,

I write on behalf of the Environmental Justice Community Action Network (EJCAN) in support of CleanAIRE NC's (CANC) proposal to the EPA titled "Sampson County Air Monitoring Network." I, along with my fellow board members, strongly support this grant application and your proposed work with Sampson County residents to monitor pollution levels from surrounding industries and engage the community members in clean air education and advocacy training.

EJCAN is a North Carolina-based 501(c)(3) nonprofit organization focused on achieving environmental justice. EJCAN's mission is to inform, educate, and empower communities to confront environmental injustice by advocating for change. It's vision is that all communities in NC have clean and safe air, water, and soil.

As part of this grant, EJCAN will serve as the primary partner in Sampson County. We will, along with CANC, jointly co-hire and supervise a Project Coordinator who will manage the community engagement activities, recruit citizen scientists, known as AirKeepers, and facilitate a Community Air Monitoring Advisory Board. EJCAN will serve as the community voice for this initiative connecting residents with local and state agencies, elected officials, health professionals, and other scientists.

We look forward to working with you and CANC on this critical project and bringing awareness to our community's environmental justice issues.

Sincerely,

Sherri White-Williamson
EJCAN Board Chair

UNC | GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH

THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL
GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH
Department of Environmental Sciences and Engineering

O 919-966-1171 | F 919-966-7911

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sph.unc.edu/envr

March 17, 2022

June Blotnick
Executive Director
CleanAIRE NC
933 Louise Avenue #499
Charlotte, NC 28204

RE: Enhanced Air Quality Monitoring for Communities
RFA NUMBER: EPA-OAR-OAQPS-22-01

Dear Ms. Blotnick,

This letter is written on behalf of the Institute for Environmental Health Solutions in support of CleanAIRE NC's (CANC) proposal to the EPA titled "*Sampson County Air Monitoring Network.*" I strongly support this grant application and your proposed work with Sampson County residents to monitor pollution levels and engage the community members in air quality education through the usage of online interactive mapping tools. The Institute for Environmental Health Solutions (IEHS) is housed within the Gillings School of Global Public Health at UNC-Chapel Hill. The mission of the IEHS is to reduce the burden of environmentally-influenced disease and improve human health. The IEHS serves as the nexus for transdisciplinary, environmental health-focused experts. With an emphasis on translation and applied science, the IEHS focuses on research and education to enhance transdisciplinary team-science. Currently, the IEHS has four human health divisions that function as intellectual foci for specific environment-human health problems. These include: (1) The *Cancer Survivors Health Division,* (2) The *Metabolic Health Division*, (3) the *Perinatal Health Division*; and (4) the *Respiratory Health Division*. Together the IEHS members focus on identifying solutions to promote environmental health.

As part of this grant, my colleagues and I will provide Sampson County residents involved in the project with training on how to use our online mapping tool, NC ENVIROSCAN and get their feedback on how to improve the mapping tool to further meet their needs. NC ENVIROSCAN is an interactive mapping tool that helps North Carolina communities increase awareness of key environmental and societal factors impacting health. We will also work with CANC and Sampson County residents to include data from PurpleAir monitors deployed during the project in Enviroscan, along with respiratory health indicators. NC ENVIROSCAN was developed to provide community members, academic researchers, and public health practitioners with a tool to locate areas of concern in North Carolina for toxic chemicals, social stressors, and disease trends. We are excited to leverage our existing project with the great work of CleanAIRE NC and increase community awareness of environmental health trends across the state.

Sincerely,

Rebecca C. Fry, Ph.D.
Associate Chair, Department of Environmental Sciences and Engineering
Director, Institute for Environmental Health Solutions
UNC Chapel Hill, NC

CHARLOTTE
COLLEGE OF LIBERAL ARTS & SCIENCES
GEOGRAPHY & EARTH SCIENCES

March 25, 2022

June Blotnick
Executive Director
CleanAIRE NC
933 Louise Avenue #499
Charlotte, NC 28204

RE: Enhanced Air Quality Monitoring for Communities RFA NUMBER: EPA-OAR-OAQPS-22-01

Dear Ms.Blotnick,

I am writing this Letter of Support for the CleanAIRE NC proposal to the EPA titled "Sampson County Air Monitoring Cluster Network". I am an expert in air quality and climate, and am an Associate Professor of Atmospheric Sciences at the University of North Carolina at Charlotte in Charlotte, North Carolina. I have also collaborated formally and informally with CleanAIRE NC since about 2015, so have a long-standing relationship with the staff and deep knowledge of the CleanAIRE NC mission and vision.

My contribution to the CleanAIRE NC proposed project "Sampson County Air Monitoring Cluster Network" will be attending and participating in community planning meetings, developing and implementing the experiment design, data management and analysis, and technical help in setting up the low-cost air sensors. I will also aim to publish the results and related experiences in peer-reviewed journals for wider dissemination of the outcomes of the proposed Sampson County Air Monitoring Cluster Network. My contributions will leverage my existing relationship with CleanAIRE NC and my technical expertise in air quality science and low-cost sensor technology to help CleanAIRE NC and participating community organizations more effectively achieve the proposed goals of the Sampson County Air Monitoring Cluster Network.

Sincerely,

Dr. Brian Magi
Associate Professor of Atmospheric Sciences
UNC Charlotte, Department of Geography and Earth Sciences
brian.magi@uncc.edu | http://brianmagi.uncc.edu | 704-687-5973

RTI INTERNATIONAL
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March 25, 2022

June Blotnick
Executive Director
CleanAIRE NC
933 Louise Avenue #499
Charlotte, NC 28204

RE: Enhanced Air Quality Monitoring for Communities
RFA NUMBER: EPA-OAR-OAQPS-22-01

Dear June,

I am pleased to confirm my availability and commitment to support your proposal to EPA and thank you for the opportunity to have members of my team participate in this collaboration with you. I am enthusiastic about this proposal, which aims to build air quality monitoring capability to examine local issues and empower communities in Sampson County, NC through wonderful collaboration with the community, CleanAIRE NC, UNC-Chapel Hill, and UNC-Charlotte.

As Co-Investigator to the project, I will lead RTI's research activities and manage financial milestones. For technical work, RTI team will assist in designing, preparing, and executing air quality monitoring study, leveraging our existing air quality monitoring expertise. Dr. Prakash Doraiswamy on my team will provide a PurpleAir sensor data dashboard, developed from his NASA-funded Citizen Science project. We will train community staff for air sample and data collection and usage of the data dashboard; perform air quality data analysis; assist in data interpretation, and contribute to EPA reports. I believe my multidisciplinary collaboration and project management experience, and technical expertise in air quality and exposure monitoring through various community-based environmental exposure and health studies including two EPA STAR grant studies make me uniquely qualified to contribute to and achieve the goals of the proposed study.

I look forward to working with the project team on this initiative, and if you have any questions, please contact me directly at scho@rti.org or 919-541-6761.

Sincerely,

Seung-Hyun Cho
Research Aerosol Engineer and Exposure Scientist
Air Quality and Exposure
Research Triangle Institute

PROJECT NARRATIVE | Sampson County Air Monitoring Network

I. Cover Page

- **Project Title:** Sampson County Air Monitoring Network
- **Applicant Information:**
  - Applicant Organization: Clean Air Carolina d/b/a CleanAIRE NC (CANC)
  - Address: 933 Louise Avenue, Suite 499, Charlotte, NC 28204
  - Primary contact name, phone number, and e-mail address: Kerstan Ryan, 704.307.9528, Ext. 110, Kerstan@CleanAIREnc.org
  - DUNS number: 078680184
- **Set-Aside:** No set-aside
- **Brief Description of Applicant Organization:** Our mission is to advocate for the health of all North Carolinians by pursuing equitable and collaborative solutions that address climate change and air pollution. We recognize health impacts from air pollution and climate change disproportionately affect low-income and communities of color and contribute to existing health disparities. We fight for a cleaner North Carolina using policy advocacy and litigation, education, community organizing, and innovative partnerships. Our programs include Citizen Science AirKeepers, Medical Advocates for Healthy Air, Environmental Justice, and the NC Climate Ambassadors Program.
- **Project Partner(s):**
  - **Partner Organizations:** Environmental Justice Community Action Network, UNC-Chapel Hill Institute for Environmental Health Solutions, UNC-Charlotte Department of Geography and Earth Sciences, and Research Triangle Institute
  - **Partner Primary Contact Name:** Sherri White-Williamson, Environmental Justice Community Action Network
- **Project Location:** Sampson County, North Carolina, 28328, 28334, 28458, 28382, 28341, 28366, 28318, 28441, 28453, 28344, 28385, 28393, 28444, 28447, 28329
- **Air Pollutant Scope:** $PM_{2.5}$, VOCs, and H_2S
- **Budget Summary**:

EPA Funding Requested	Total Project Cost
$500,000	$500,000

- **Project Period:** January 1, 2023 - December 31, 2025
- **Short Project Description:** CleanAIRE NC, in partnership with Environmental Justice Community Action Network, will establish an air monitoring network in Sampson County to address long-standing health inequities and environmental justice implications caused by cumulative air pollution impacts from non-traditional sources. We will measure particulate matter less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$), volatile organic compounds (VOCs), speciated VOCs, and hydrogen sulfide (H_2S) emitted from swine and poultry concentrated animal feeding operations (CAFOs), Sampson County Landfill, and Enviva Sampson wood pellet facility. Twenty community members, known as AirKeepers, will host PurpleAir sensors (low-cost sensors that report $PM_{2.5}$) and engage in data collection via study design and implementation. CleanAIRE NC will work with partner organizations and AirKeepers to implement clean air education, technology and advocacy training to facilitate understanding of the data, increasing agency and empowerment. This knowledge will motivate changes to local and state policies related to major sources of air pollution in the county. The project will provide the basis for developing and scaling the initiative as a state and national, evidence-based model of an air quality monitoring project based on the principles and practices of community partnerships, community engagement, quality data collection and control, and environmental justice.

II. Workplan

Section 1 – Project Summary and Approach

A. Overall Project

This proposed Sampson County Air Monitoring Network is an expansion of the CleanAIRE NC (CANC) Citizen Science AirKeeper Program, which was established in 2016 in the Historic West End of Charlotte, North Carolina, a former red-lined community surrounded by two interstates and industrial sources. Between 2017 and 2021, the AirKeeper Program spread statewide as we deployed PurpleAir sensors in rural and urban areas collecting $PM_{2.5}$ data for community use and scientific research as well as , informing stakeholders. Based on a recent comprehensive analysis of that network by Eastern Research Group, CANC made a strategic shift to concentrate larger networks of monitors in counties with environmental justice communities suffering from cumulative impacts of air pollution. Since $PM_{2.5}$ can be localized or travel long distances, the concentration of multiple monitors will allow researchers to identify trends of disproportionate exposure in environmental justice communities and provide solutions towards reducing the impacts on human health. We have also expanded our AirKeeper engagement and training programs to better involve citizens in clean air advocacy and build the capacity of local groups. The proposed project activities fall into four categories: Community Engagement and Listening Sessions, Air Sampling and Data Collection, Data Analysis and Reporting, and Air Quality Advocacy.

Community Engagement and Listening Sessions

While a CANC staff member will administer the grant, to fully engage interested residents during this 3-year project, we will work with the Environmental Justice Community Action Network (EJCAN) to hire a Project Coordinator from Sampson County who understands the impacts of the growing swine and poultry industry, has seen the major expansion of the Sampson County Landfill, and has witnessed the deforestation and air pollution impacts from the Enviva Sampson wood pellet facility. The EJCAN Project Coordinator will be responsible for overseeing all aspects of community engagement and will work with CANC's Citizen Science Manager to develop a community engagement plan. Initial engagement activities include organizing orientation sessions to hear from residents about local air pollution concerns and related health impacts. 20 AirKeepers will be recruited via the orientation sessions, with the intent that they will be responsible for maintaining air monitoring during the project. Throughout this process, residents will be identified who are interested in joining the new Community Air Monitoring Advisory Council, which will include scientists. The Project Coordinator will manage the deployment of the PurpleAir monitors and monthly meetings for AirKeepers during the first 16 months of the project. At monthly meetings AirKeepers will hear from scientists, health professionals, and other resources to advance learning. Clean air education and advocacy training are key components that will be implemented to build the capacity of EJCAN and AirKeepers.

Air Monitoring and Data Collection

Air monitoring and data collection will be conducted for 12 months, starting after six months of initial community engagement activities. AirKeepers will collect data on $PM_{2.5}$ using PurpleAir sensors equipped with built-in Wi-Fi. However, given limited Wi-Fi connectivity in Sampson County, we plan to purchase hotspot data plans for the PurpleAirs to connect to. We will purchase PurpleAir sensors with SD internal memory cards to store the data locally as another backup layer. One of our partner organizations will add the PurpleAir sensors connected to Wi-Fi or the hot spot to a prototype PurpleAir data dashboard developed via a NASA-funded citizen science project. H_2S sampling will also use Aeroqual S-500s at two locations to collect H_2S real-time data to understand temporal trends with high time-resolution data. Passive badges will be used to monitor hydrogen sulfide gas concentrations (H_2S) at the 20 AirKeeper sites in each season, given the many CAFOs in the county and continuous odor complaints. For VOC sampling, a mobile monitoring system called DART (Data Acquisition and Real Time) will be used. The DART system, strapped to the top of a vehicle, continuously measures the total concentration of volatile

organic compounds (VOCs) at sub-minute intervals and has been used successfully for recent U.S. EPA enforcement activities in Rhode Island and Baltimore. Residents will help inform where and when the DART should and could be deployed to target sources of pollution. In addition to total VOCs, the DART is also equipped to deploy Summa stainless steel sampling canisters for intermittent air samples. These canister samples will be used to report VOC speciation. The DART total and speciated VOC data will be used to identify peaks around Sampson County. This data will inform the location of a stationary air toxics VOC monitoring network, established and maintained with the assistance of AirKeepers, the EJCAN Project Coordinator, and partner organizations. The air monitoring plan and purpose will be shared with community residents as well as the county health department, county commissioners, state legislators, NC Division of Air Quality, NC Office of Minority Health and Health Disparities, and the NC Department of Environmental Quality's Environmental Justice and Equity Advisory Board.

Data Analysis and Reporting

Scientists will provide updates on data analysis performed on H_2S, $PM_{2.5}$, and VOCs to CANC, the AirKeepers, and the Community Air Monitoring Advisory Council on at least a monthly basis. Less frequent but more processed versions of those analyses will be shared with the broader Sampson County community quarterly to keep stakeholders up-to-date on data collection, analysis, and engagement activities related to the Sampson County Air Monitoring Network. Via reciprocal feedback from the AirKeepers and community members, partner organizations, and CANC see will oversee the enhancement of an existing user-friendly data visualization tool (the prototype NASA-funded dashboard) to enhance learning, engagement, and agency. AirKeepers will receive training on how to use the PurpleAir dashboard to better understand how to interpret their data collection and provide important feedback on the use of this tool to scientists. It is important to recognize that the dashboard development is a two-way street where scientists and community members learn from each other about effective ways to communicate findings. When the data has been vetted and post-processed sufficiently, CANC and EJCAN will organize it for dissemination to local and state agencies listed above. Project activities will be documented with interim reports and a final report with recommendations, and a story map widely distributed to relevant stakeholders.

Air Quality Advocacy

With the rapid expansion of industrialized animal agriculture and the wood pellet industry in low-income and communities of color, as well as a farm-friendly legislature that has cut funding for environmental oversight, clean air advocacy is sorely needed in environmental justice communities. Access to data is a tool that has been missing in previous efforts. To bridge this barrier, UNC-Chapel Hill researchers will train AirKeepers and the Community Air Monitoring Advisory Council to use the NC ENVIROSCAN tool to identify areas of concern for toxic chemicals, social stressors, and disease trends. Since $PM_{2.5}$ levels are an issue of concern, they will work with CANC to include Sampson County PurpleAirs in NC ENVIROSCAN. Clean air advocacy training will be tailored to increase data and transparency on pollutant levels, reduce emissions from specific sources, and consider the cumulative impacts in future air permitting decisions. Advocacy targets include the location of a VOC monitor in Sampson County, capping the Sampson County Landfill, expanding the state's Hazardous Chemical Right to Know Act, and changing the state's air permitting process to include cumulative impacts.

B. Project Significance

Sampson County is the second-largest county in North Carolina with a population of roughly 64,000, 54% of which are communities of color, per the 2020 U.S. Census. The county's vast acreage makes it prime real estate for industry, which has worsened many residents' quality of life. Over the past three decades, Sampson County has found itself the home to major polluting entities, including the Sampson County Landfill, Enviva Sampson wood pellet facility, and several million swine living in large, concentrated housing. As of April 2020, over 2.1 million swine lived in the county. Sampson is the second-largest

producer of swine and poultry in the nation, trailing behind neighboring Duplin County. Sampson County is the largest producer of turkeys in NC. Commercial poultry farms produce more waste laden with nitrogen and phosphorus than the state's massive commercial swine farms but require no operating permits, face no requirement to submit waste management plans to the Department of Environmental Quality, and can only be inspected if someone in the community complains about their operations. In addition to emissions-producing facilities, the coronavirus pandemic highlighted the long-standing health and health care disparities that communities of color face. In Sampson County, the adverse effects of living close to industrial farms are well-documented. A study conducted by Environmental Health Scholars at Duke University School of Medicine and published in the NC Medical Journal found that communities near swine CAFOs had higher all-cause and infant mortality, resulting in more deaths due to anemia and kidney disease, tuberculosis, and septicemia. These residents also experience higher rates of hospital admissions, emergency room visits, and low birth weight infants. Further research in a new study published May 2021 in the Proceedings of the National Academy of Sciences detailed how agriculture is a major contributor to air pollution—the largest environmental risk factor for mortality in the United States—through its production of food-related $PM_{2.5}$ emissions. Sampson County is historically underrepresented in regulatory enforcement and community engagement activities of air and water pollution. The state of North Carolina monitors for criteria pollutants (e.g., ozone, particulate matter, sulfur dioxide) and hazardous air pollutants (HAPs) statewide. These monitors, especially for criteria pollutants, are dispersed geographically and near large cities. Monitoring for air toxics is even more limited with only seven locations. Prolonged exposure to certain air toxics can lead to cancer and/or non-cancer effects.

The four nearest air toxics monitoring locations to Sampson County, through 2021 are AQS Site 37-129-0010 in Wilmington, NC (~34 miles southeast of Sampson County) with speciated VOCs (e.g., benzene), AQS Site 37-183-0014 in Raleigh, NC (~37 miles northwest of Sampson County) with speciated VOCs (e.g., benzene) and carbonyls (e.g., formaldehyde), AQS Site 37-147-0006 in Greenville, NC (~ 56 miles northeast of Sampson County) with speciated VOCs (e.g., benzene), and AQS Site 37-123-0001 in Montgomery County, NC (~72 miles west of Sampson County) with speciated VOCs (e.g., benzene) and carbonyls (e.g., formaldehyde). There is a large geographic "hole" for air toxics monitoring in the Sampson County area. Further, the existing air toxics monitoring locations are not placed near swine, poultry, or other emission sources. Given the number and size of swine farms and unregulated poultry operations dispersed throughout the county, the use of the DART sampling system along with monitoring $PM_{2.5}$ and H_2S is key in providing focus for targeting the highest priority areas.

Section 2 – Community Involvement

A. Community Partnerships

Environmental Justice Community Action Network (EJCAN) is a North Carolina-based, 501(c)(3) nonprofit organization focused on achieving environmental justice. Headquartered in Sampson County, EJCAN will work with CleanAIRE NC to hire and supervise a local Project Coordinator. They will also provide oversight of all community engagement activities including leading the creation of a Community Air Monitoring Advisory Council. EJCAN is chaired by Sherri White-Williamson, a Sampson County native, and Environmental Justice Policy Director at the NC Conservation Network where she connects impacted communities with resource organizations and decision-makers. Previously, Sherri worked at the U.S. EPA in the Office of Environmental Justice. Board member and native Sampson County resident, Danielle Koonce, is completing her Ph.D. in sociology with a focus on racism and the environment at the University of Maryland. Her dissertation focuses on issues impacting the people and places where she grew up. Through this partnership, EJCAN benefits by having unbiased data collected, analyzed and synthesized into a comprehensive report that will aid residents in the fight for clean air. CleanAIRE NC

will continue this partnership with EJCAN in the years to come as we work with residents to achieve their clean air advocacy goals.

UNC-Chapel Hill Institute for Environmental Health Solutions (IEHS) works to reduce the burden of environmentally-influenced disease and improve human health. Dr. Rebecca Fry and her team will provide Sampson County residents involved in the project with training on how to use the newly developed online mapping tool, NC ENVIROSCAN. The tool is designed to help North Carolinians increase awareness of key environmental and societal factors impacting health. Dr. Fry will work with CANC and Sampson County residents to include data from PurpleAir monitors deployed during the project in ENVIROSCAN. They will also get input from residents on the types of respiratory health indicators to include. Dr. Fry and her colleagues will benefit from this partnership by expanding the amount of data in their mapping tool, particularly from rural, marginalized communities. They will also benefit from receiving direct input from residents regarding the usability of the tool which will result in broader access to environmental health trends across the state. As our work to create air monitoring networks in environmental justice communities scales, CANC plans to share our data with IEHS.

UNC-Charlotte Associate Professor of Atmospheric Sciences Dr. Brian Magi is an expert in air quality and climate. Dr. Magi has collaborated formally and informally with CleanAIRE NC since 2015 and has been our primary academic advisor in the development of our citizen science program. Dr. Magi's role in this project consists of serving as a key scientific advisor where he will attend and participate in community planning meetings, develop and implement the PurpleAir monitoring experiment design, conduct data management, and analysis, and provide technical help in setting up the low-cost air sensors. He will also publish the results and related experiences in peer-reviewed journals for wider dissemination of the outcomes of the project. UNC Charlotte will benefit from Dr. Magi's participation because it will add rural air quality data from PurpleAir sensors to his existing field of research which is focused on urban settings and advance his technical expertise in air quality science using additional types of low-cost sensor technology. As the chair of our Citizen Science Advisory Board, we expect to continue our relationship with Dr. Magi as our citizen science program expands.

Research Triangle Institute (RTI) is an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide. Research Aerosol Engineer and Exposure Scientist Dr. Seung-Hyun Cho will lead RTI's research activities and assist in designing, preparing, and executing the H_2S air quality monitoring study, leveraging her existing air quality monitoring expertise. Dr. Prakash Doraiswamy on my team will provide a PurpleAir sensor data dashboard, developed from his NASA-funded Citizen Science project. RTI will train community staff for air sample and data collection and usage of the data dashboard; perform air quality data analysis; assist in data interpretation, and contribute to EPA reports. RTI will benefit from this partnership through direct engagement with an environmental justice community in air quality research. They will also benefit from feedback received from new citizen scientists on the use of the PurpleAir sensor data dashboard. CANC will benefit from RTI's air quality and exposure research as we expand our monitoring model beyond Sampson County.

B. Community Engagement

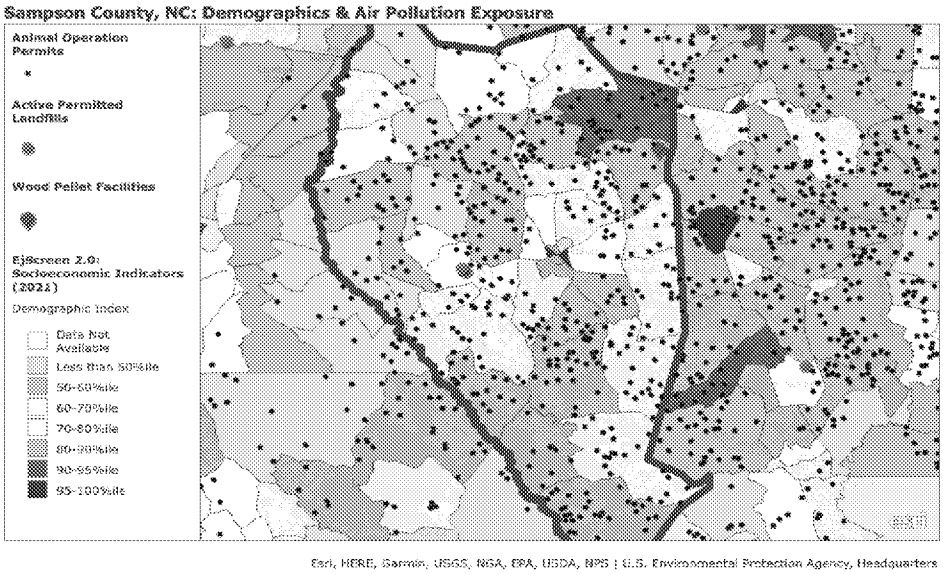
With our primary partner, EJCAN, we have already begun to engage community members in the design and planning of this project. Since 2021, EJCAN has worked with Sampson County residents to monitor nitrate levels in water from approximately 200 homes near CAFOs. This water sampling effort has provided EJCAN with a robust list of residents concerned with water and air pollution. This project will provide an opportunity for EJCAN to further engage those residents in air quality monitoring as they recruit volunteers to be AirKeepers and members of the new Community Air Monitoring Advisory Council. We plan to engage community members in the design and performance of the proposed project in several ways. A series of orientation sessions will be held during the first six months of the project. Targeted outreach to residents living near the three major sources of pollution as well as broader

community outreach to churches, community-based organizations, public health professionals and physicians, and elected officials will be used to solicit input. During the 12 months of air monitoring, AirKeepers and the Community Air Monitoring Advisory Council will meet monthly and provide feedback on project implementation and suggest improvements to increase effectiveness and responsiveness to community concerns. Residents will help determine the route used for the DART car that will be used to collect VOC samples. Stipends from the grant will be used to incentivize engagement in monthly meetings, trainings, air monitoring, and efforts to reduce pollution. All of the data collected on $PM_{2.5}$, H_2S, and VOCs will be reviewed and analyzed by our scientific partners and made public to the community in the form of reports and a story map that will be available for educational research in perpetuity.

Section 3 – Environmental Justice and Underserved Communities

Our proposed project ultimately seeks to reduce air pollution linked to serious health impacts for Sampson County residents, as well as address the wide-scale pattern of environmental injustice which continues to plague black and brown communities who suffer from disproportionate exposure and health outcomes. Many studies have demonstrated that low-income neighborhoods and communities of color contain more pollutant sources and have higher exposures to air pollutants. The social, economic, and health inequities that these populations face can also make them more vulnerable to the effects of air pollution. $PM_{2.5}$, H_2S, and VOCs are all linked to the five major causes of death reported by the 2019 State of the County Health Report. These are 1) Cancer, 2) Heart Disease, 3) Diabetes Mellitus, 4) Cerebrovascular Diseases (stroke), and 5) Chronic Lower Respiratory Diseases.

The map below combines population characteristics and air pollution burden indicators to provide a thematic visual of environmental injustice by block group within Sampson County. The population characteristics chosen are a combination of socioeconomic indicators of sensitive populations that together reflect a population's vulnerability to pollutants. The pollution burden indicators are a combination of direct exposure and the presence of industrial operations which are present in the community. Together, these indicators help describe and visualize the disproportionate impact that environmental pollution has on Sampson County residents.



This cumulative impact or total harm to public health and the environment, shown in the map above is systematically overlooked but contributes greatly to health outcomes in the County. Given the disproportionate and adverse health impacts affecting a large percentage of Sampson County residents and the cumulative impacts of major sources of air pollution, we expect the community to experience

long-term health benefits from the project through the reduction of emissions. By creating the Sampson County Air Monitoring Network, residents will learn how to collect, analyze, and synthesize data on three major pollutants emitted in their communities which may play a role in higher mortality rates. The high level of community interest and engagement in previous water quality monitoring by EJCAN is a strong indicator that our more robust air monitoring project will prove successful.

Section 4 – Environmental Results—Outcomes, Outputs and Performance Measures

A. Expected Project Outputs and Outcomes

The Sampson County Air Monitoring Network clearly links to the EPA's 2022-2026 Strategic Plan with its emphasis on community-based air monitoring in low-income and marginalized communities and the use of data to reduce the impacts of cumulative sources of air pollution. North Carolina is home to the second-largest swine farming industry in the country primarily located in eastern North Carolina where Sampson County is located. The project outputs and outcomes are designed to engage residents in a county-wide air monitoring program and provide the tools and resources needed for them to decide the best strategies for reducing specific sources of air pollution. We anticipate key outcomes will be achieved by the end of the 3-year period and that progress is being made on several other long-term outcomes. Specific outputs and outcomes are listed below.

Outputs	Outcomes
Community Engagement and Listening Sessions	
1. Hire and train one local Project Coordinator with EJCAN 2. Hold three orientation/listening sessions 3. Recruit nine members for Community Air Monitoring Advisory Council including community representatives and scientists 4. Recruit 20 AirKeepers to host PurpleAir monitors and participate in technology and advocacy trainings, monthly meetings, and quarterly and annual evaluations during the 3-year project period 5. Hold Community Air Monitoring Advisory Council meetings regularly	1. Short-term: Local trained project leadership established 2. Short-term: Community concerns about air pollution are documented and project information conveyed 3. Short-term: Community oversight team recruited to monitor progress 4. Short-term: 100% of the AirKeepers are effectively implementing the air monitoring program, following initial and ongoing training and support; increased level of community awareness about use of portable air sensors to monitor air pollution near their homes 5. Short-term: Expanded knowledge base of local sources of pollution, NC's air permitting and monitoring program; expanded project oversight
Ambient Air Monitoring and Data Collection	
1. Deploy PurpleAir monitors to 20 AirKeepers 2. Deploy additional air monitoring equipment to measure levels of H_2S and VOCs	1. Short-term: 100% of monitors are operational and recording relevant data in a useful way without major technical and delivery challenges; increased community awareness of $PM_{2.5}$ levels 2. Short-term: 100% of equipment is operational and recording relevant data in a useful way without major technical and delivery challenges; first-ever community engagement in the collection of $PM_{2.5}$, H_2S and VOCs in Sampson County
Data Analysis and Reporting	

1. Add newly deployed sensors to the prototype PurpleAir data dashboard 2. Compile quantitative data on air emissions and analyzed from all sites 3. Develop, publish, and disseminate a final project report and story map that includes quantitative and qualitative evaluation ensure the project is an effective and successful, evidence-informed project	1. Short-term: Increased community understanding and interpretation of $PM_{2.5}$ data collection; new sources of data for RTI to evaluate and new insight on usability by citizen scientists in environmental justice communities 2. Intermediate: Increased chance of successful community advocacy to mitigate certain pollutants 3. The final report advances the project as an evidence-informed, rural air monitoring program with the capacity to be duplicated and evaluated in multiple settings and be scaled up in North Carolina and the nation as a comprehensive, evidence-based, national model.
Air Quality Advocacy	
1. Develop and provide clean air advocacy training program in collaboration with EJCAN, UNC-Chapel Hill, and AirKeepers to the community 2. Hold three meetings with local and state officials to review advocacy plans	1. Intermediate: Three strategic advocacy plans are created using results of the data analysis to set mitigation goals for each source of pollution monitored 2. Intermediate: Advocacy plans are updated to include input from local and state officials to include targeted policy changes

B. Performance Measures and Plan

The proposed performance measures we will use to track, measure, and report progress towards achieving the expected outputs and outcomes are both quantitative and qualitative. The following quantitative data will be collected and evaluated during the 3-year project: # of AirKeepers trained and skilled in monitoring using pre-and post-test data; # of residents trained and skilled in using the dashboard based on pre-and post-tests; # of PurpleAir sensors deployed and included in the PurpleAir dashboard and NC ENVIROSCAN; # of air toxics monitoring canisters sited in the community to measure VOCs; # of passive badges used to collect H_2S emissions; # of quarterly and annual project evaluation reports filed based on document review; and publication of the final project report with evidence-informed data and analysis.

The following qualitative data will be collected and evaluated during the 3-year project. The quality of community engagement, knowledge gained, and perspectives transformed regarding the importance and impact of air quality monitoring among project staff, AirKeepers, and community residents utilizing the dashboard based on six interviews and data analysis; recognition of the strengths and challenges of the project in relation to the project's process (and effectiveness), products (and successes), and insights based on six interviews and data analysis with project and organizational staff and leaders, AirKeepers and key community stakeholders; the impact level of the project on new local and state air quality policy, procedures, and practices based on four interviews and data analysis with project staff and key stakeholders. The project will include a comprehensive evaluation by an external evaluator and trainer with decades of experience in evidence-informed and evidence-based program design, research, evaluation, and training. Performance measures related to grants administration, overseeing sub-recipients and contractors/ vendors, and tracking and reporting project expenses and purchases will be managed by our grants administrator. Reports to the boards of CANC and EJCAN will be provided quarterly to ensure proper oversight.

C. Timeline and Milestones

Quarterly and annual evaluations will be performed throughout the 3-year project.

Year 1: January 1, 2023-December 31, 2023 | Air Monitoring & Data Collection/Community Engagement
Monthly AirKeeper meetings will be held during Year 1 and the first half of Year 2.

Q1: Hire Project Coordinator, recruit members to the Community Air Monitoring Advisory Council, create community engagement plan
Q2: Hold orientation sessions, recruit 20 AirKeepers and provide technology training, order equipment for $PM_{2.5}$ and H_2S monitoring, release vendor RFP for VOC monitoring, select and contract VOC vendor; outreach to stakeholders about the project
Q3: Hold community and advisory board meetings, begin 12-month monitoring study, install $PM_{2.5}$ and H_2S equipment, VOC DART car deployed, continue technology training, administer AQ knowledge pre-surveys to AirKeepers; story map project begins; outreach to press/media planning
Q4: First AQ data reports, PurpleAir Dashboard and mapping tool training; continued outreach to stakeholders, air toxics network for VOCs installed

Year 2: January 1, 2024-December 31, 2024 | Air Monitoring & Data Collection/Data Analysis & Reporting/Community Engagement
Q1: Continued monitoring of all pollutants, continued monthly AirKeeper meetings, continued advisory board meetings; data stories collected from AirKeepers, clean air advocacy training begins
Q2: Second AQ data report, continued monitoring of all pollutants, continued monthly AirKeeper meetings; preparations for completion of 12-month air monitoring study, clean air advocacy training
Q3: 12-month monitoring study concludes; AirKeepers continue to use PurpleAir sensors, data stories collected; outreach to stakeholders announcing milestone of one year of monitoring; clean air advocacy training
Q4: Data analysis finalized, data visualization resources developed; first draft of story map completed and publicized to community and stakeholders; outreach to press

Year 3: January 1, 2025-December 31, 2025 | Community engagement/Final Report
Q1: Data on all performance measures and outcomes collected in preparation for final report; advocacy plans developed for pollutant mitigation; meetings with local and state officials to discuss advocacy plans and solicit feedback and recommendations; Community Air Monitoring Advisory Council meeting
Q2: Continued work on the final report and story map; continued advocacy efforts
Q3: Continued work on the final report and story map; continued advocacy efforts; research on peer-reviewed journals for publication; continued outreach to stakeholders
Q4: Final report released to community and all stakeholders at a press event; progress made on mitigation efforts announced; story map sent to NC environmental justice organizations and list-serves; final project evaluation completed; financials reconciled and all payments sent.

Section 5 – Quality Assurance Statement (See Attachment)

Section 6 – Programmatic Capability and Past Performance

A. Past Performance

Relevant funding received was provided by the Z. Smith Reynolds Foundation. Between 2019 and 2022, CANC received a total of $115,000 for the Citizen Science AirKeepers program. CANC was selected as an EPA 2021 Environmental Justice Small Grants Program recipient but we have not yet been notified regarding fund disbursement and grant start date. We were able to successfully complete and manage those agreements with Z. Smith Reynolds Foundation with the expertise of our program managers and grants administration staff with oversight by our Executive Director.

B. Reporting Requirements

As part of the grant award agreements, requirements for Z. Smith Reynolds funding were to complete reports both at mid-year and at the end-of-grant cycle. The information we provided included our progress on the project's expected outcomes and outputs and grant successes.

C. Staff Expertise

CANC has a history of developing high-quality, technical air quality documents for public consumption and policy initiatives detailed in the Quality Assurance Statement. Our staff expertise includes specialized expertise in air quality regulations and policy making, energy and transportation advocacy and policy making, citizen science air monitoring, health professional training on the health impacts of air pollution and climate change, and environmental justice community education and organizing. In addition to our team, we have a dedicated Board of Directors, including health and science professionals committed to advancing equitable solutions to environmental injustices. Our Health and Citizen Science Advisory Boards are made up of university health and science professors and researchers, practicing and retired clinicians, and state and national citizen science leaders. Executive Director June Blotnick has led the organization since 2005 in the creation of innovative programs and key partnerships as well as advocacy efforts that have resulted in reductions of air toxics, particle pollution, and carbon emissions. The project manager for this proposal is CANC's Citizen Science Manager, Denise Bruce. Denise has over a decade of experience working with community organizations in eastern North Carolina on environmental issues. Prior to joining the CANC team, Denise worked for the NC Division of Air Quality where she analyzed and interpreted NC Air Quality Rules for the purposes of compliance and managed air quality educational programs with diverse stakeholders.

Section 7 – Budget

A. Budget Detail

Line Item & Itemized Cost	EPA Funding**
Personnel	
(1) EJCAN Project Coordinator Year 1: $50,000, Year 2: $25,000, Year 3: $25,000	$100,000
(1) CANC ED: 5% (1) CANC Citizen Science Manager: 30% (1) CANC Environmental Justice Manager: 5% Years 1-3	$79,200
(1) UNC Charlotte Professor for 1 month of time for Year 1-3 of the proposed work	$59,000
(1) Research Triangle Institute (Years 1-3)	$80,000
TOTAL PERSONNEL	**$318,200**
Fringe Benefits	
N/A	N/A
TOTAL FRINGE BENEFITS	**$0**
Travel	
EJCAN Project Coordinator: 50%	$5,000
CANC Staff: 50%	$5,000
TOTAL TRAVEL	**$10,000**

Equipment	
(20) PurpleAir Monitors @ $300 ea.	$6,000
(10) Wi-Fi Mobile Hotspots @ $50 ea.	$500
(2) Aeroqual S-500s H_2S Sensors @ $3,000 ea.	$6,000
(20) H_2S Sampling Kits @ $219.55 ea.	$4,391.00
TOTAL EQUIPMENT	**16,891.00**
Supplies	
Marketing Materials (posters, brochures, flyers, postcards, social media posts for advertising)	$500
Educational Materials @ $50 x 20 participants	$1,000
Meeting Refreshments $250 x 10 meetings	$2,500
TOTAL SUPPLIES	**4,000.00**
Contractual	
(1) Support Services Contract for DART monitoring and Air Toxics Network	$70,000
(1) External Project Evaluation	$20,000
TOTAL CONTRACTUAL	**$90,000**
Other	
(20) AirKeeper Stipends @ $100 x 12 months	$24,000
(1) EJCAN Stipend for project oversight @ $5,000 x 3 years	$15,000
TOTAL OTHER	**$39,000**
Indirect Charges	
Federal Indirect Cost Rate x Personnel = Indirect Costs (Federal Negotiated Indirect Cost Rate = 10%)	**$21,909**
TOTAL INDIRECT	**$21,909**
TOTAL FUNDING	**$500,000**
TOTAL PROJECT COST	**$500,000**

B. Reasonableness of Costs

Personnel includes an EJCAN Project Coordinator role that will oversee community engagement and 20 AirKeepers totaling $100,000. This position will be full-time for year one at $50,000 and part-time for years two and three at $25,000 each. Additionally, the CANC ED, Citizen Science Manager, and Environmental Justice Manager will devote 40% of their time collectively to the project during the 3-year period totaling 79,200.00. UNC-Charlotte Professor Brian Magi's costs total $59,000 for 1 month of time during the project's three years and Research Triangle Institute totals $80,000 for their time to conduct H_2S monitoring and training on the newly developed PurpleAir Dashboard. **Travel:** We have allocated $5,000 to the EJCAN Project Coordinator for travel during the three years and $5000 for CANC staff travel. **Equipment**: We will purchase 20 PurpleAir monitors, 10 WI-FI hotspots, two Aeroqual S-500s sensors, and 20 H_2S sampling kits to collect data from the pollution sources. **Supplies:** We will spend $200 on supplies, $500 on advertising to aid in community recruitment efforts, $1,000 on educational materials that will explain how to interpret the data and/mapping tools, and $2,500 on meeting refreshments. **Contractual:** We have budgeted $70,000 in vendor costs for the DART monitoring and air toxics network and $20,000 for a professional evaluation. The evaluation will allow us the opportunity to scale this project for future use in environmental justice communities. **Indirect Costs**: expenses necessary to run and fund program(s) to include rent, utilities, and administrative salaries.

C. Expenditure of Awarded Funds

CleanAIRE NC's Accounting and Financial Policies and Procedures manual outlines the organization's expenditure control guidelines. The policies and procedures included in the accounting and finance manual follow GAAP standards and have been vetted and approved by an external auditor. Should we be awarded this grant, CANC will maintain a separate bank account to house the funds and ensure timely and efficient payments to sub-recipients and vendors. Our approach to dispersing grants funds will follow the calendar below:

Year 1: **177,594** dispersed to EJCAN for personnel ($50,000), an advisory stipend ($5,000), and travel ($2,000). CANC will receive funds for personnel ($26,400), travel ($2,000), indirect costs ($7,303), and will purchase all air sensor equipment and hot spots ($16,891). Sub-awards for UNC-Charlotte ($20,000) and RTI ($30,000) will be released along with supplies ($1,000) for recruitment and meeting refreshments. We will identify an evaluator and pay for an initial assessment of the project and reporting ($5,000). Lastly, the first 6 months of AirKeeper stipends will be released ($12,000).

Year 2: **$176,703** dispersed to EJCAN for personnel ($25,000), an advisory stipend ($5,000), and travel ($2,000). CANC will receive funds for personnel ($26,400), travel ($2,000), indirect costs ($7,303). Sub-awards for UNC-Charlotte ($20,000) and RTI ($30,000) will be released along with supplies ($2,000) for educational materials and meeting refreshments. Contractor costs for continued program evaluation ($10,000), DART and air toxics network ($35,000), and the final six months of AirKeeper stipends ($12,000).

Year 3: **145,703** dispersed to EJCAN for personnel ($25,000), an advisory stipend ($5,000), and travel ($2,000). CANC will receive funds for personnel ($26,400), travel ($2,000), indirect costs ($7,303). Sub-awards for UNC-Charlotte ($19,000) and RTI ($20,000) will be released along with supplies ($1,000) for educational materials and meeting refreshments. Contractor costs for continued program evaluation ($5,000) and DART and air toxics network ($35,000).

CleanAIRE NC Quality Assurance Statement
Sampson County Air Monitoring Network
RE: Enhanced Air Quality Monitoring for Communities
RFA NUMBER: EPA-OAR-OAQPS-22-01

CleanAIRE NC has a history of developing high-quality, technical air quality documents for public consumption and policy initiatives. One example is "Clearing the Air in the Historic West End: A Report," which was written by the community organizers and leaders in Charlotte, North Carolina's "Historic West End AirKeepers," staff at CleanAIRE NC, and faculty at UNC Charlotte, and supported by regulatory and low-cost air monitoring data. Another example is a report compiled by ERG called "Clean Air Carolina PurpleAir Sensor Network Assessment, 2017-2020," with significant input from CleanAIRE NC staff and collaborating academic faculty in terms of digestible products. CleanAIRE NC staff also contributed to low-cost sensor validation efforts collaborating with academic faculty and county air regulators. This work was published in 2019 in the peer-reviewed journal *Aerosol Science and Technology*. Finally, CleanAIRE NC worked with academic researchers on methods to map air pollution in work published in 2020 in the peer-reviewed journal *Atmospheric Environment*.

Kerstan Ryan will serve as CleanAIRE NC's Quality Assurance and Quality Control (QA/QC) Manager on the proposed "Sampson County Air Monitoring Network." Kerstan has been with CleanAIRE NC for three years and serves on the grants administration team. She received her Master's degree from Arizona State University in Nonprofit Leadership and Management, specializing in grant writing, administration and reporting. She will be responsible for coordinating and working with the Project Leads to ensure adherence to the procedures that will be detailed in the Quality Assurance Project Plan (QAPP). As QA/QC Manager, she will lead the development of the project QAPP, which will be the first project deliverable to EPA, as no work on further tasks can begin until approved. The QAPP serves as the backbone in collecting representative pollutant concentrations to establish baseline levels, identifying potential sources of concern, and developing policy initiatives. Because the results of this project will be evaluated by EPA, data scientists, and community stakeholders, reproducible and transparent procedures and methodologies will be of the highest priority to be included in the QAPP. To ensure the technical quality of work products, we will prepare the QAPP following the requirements in EPA QA R-5[1].

The QAPP will address all applicable project tasks and will describe data collection, tracking, chain-of-custody, evaluation, interpretation, and dissemination of results. The QA/QC Manager will also document, where applicable, the QA/QC procedures utilized by the Contractor and Vendors, such as calibration checks, data management, and data integrity checks. The QAPP will include appropriate policies, procedures, best practices, specifications, standards, documentation, communications, and other activities necessary to ensure the accuracy and

dependability of all data collected, used, and produced during the project. CleanAIRE NC will incorporate necessary standards and procedures to minimize costs, time required to complete the project, and repetitive work. A draft QAPP will be submitted to EPA within three weeks of project initiation, and the final QAPP will be prepared within two weeks of incorporating EPA's comments. The Project Manager will ensure that no work begins by the contractor until EPA approves the final QAPP, and a written notice to proceed is sent by CleanAIRE NC to the Contractor.

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[1] Link to Historic West End report and note that this was a finalist in the ESRI Storymapper of the Year award in 2019 for "Clearing the Air in the Historic West End."

[1] https://cleanairenc.org/wp-content/uploads/2021/09/ERG-Citizen-Science-Program-Review-Summary.pdf

[1] "Partnerships in low-cost air quality monitoring and outreach in North Carolina," B. Magi (UNC Charlotte) and M. Sharova (CleanAIRE NC), Organized by: Association of Public Health Laboratories (APHL), Citizen Science Association (CSA), and the Environmental Protection Agency (EPA), Webinar Title: Make Your Citizen Science Project Count: Strategies to Produce Quality Data.

[1] *Aerosol Science and Technology* (Magi et al., 2019) https://www.tandfonline.com/doi/full/10.1080/02786826.2019.1619915

[1] *Atmospheric Environment* (Adams et al., 2020) https://www.sciencedirect.com/science/article/pii/S1352231020302168

[1] EPA QA/R-5, EPA Requirements for Quality Assurance Project Plans.

Manifest for Grant Application # GRANT13580478

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 22624 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16009 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24097 bytes)

3. Form SF424A-V1.0.pdf (size 23027 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22734 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 16002 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37260 bytes)

Attachments Included in Zip File (total 5):

1. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1234-Project Narrative.docx.pdf application/pdf (size 643649 bytes)

2. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1235-Quality Assurance Statement.pdf application/pdf (size 41246 bytes)

3. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1238-Key Personnel Resumes.pdf application/pdf (size 589483 bytes)

4. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1237-Partnership Letters.pdf application/pdf (size 1237815 bytes)

5. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1236-Proof of Nonprofit Status.pdf application/pdf (size 1477063 bytes)

IRS Department of the Treasury
Internal Revenue Service
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Cincinnati OH 45201

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CHARLOTTE NC 28299

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Employer ID Number: 57-0462653
Form 990 required: Yes

Dear Taxpayer:

This is in response to your request dated Aug. 01, 2017, regarding your tax-exempt status.

We issued you a determination letter in March 2005, recognizing you as tax-exempt under Internal Revenue Code (IRC) Section 501(c)(3).

Our records also indicate you're not a private foundation as defined under IRC Section 509(a) because you're described in IRC Sections 509(a)(1) and 170(b)(1)(A)(vi).

Donors can deduct contributions they make to you as provided in IRC Section 170. You're also qualified to receive tax deductible bequests, legacies, devises, transfers, or gifts under IRC Sections 2055, 2106, and 2522.

In the heading of this letter, we indicated whether you must file an annual information return. If a return is required, you must file Form 990, 990-EZ, 990-N, or 990-PF by the 15th day of the fifth month after the end of your annual accounting period. IRC Section 6033(j) provides that, if you don't file a required annual information return or notice for three consecutive years, your exempt status will be automatically revoked on the filing due date of the third required return or notice.

For tax forms, instructions, and publications, visit www.irs.gov or call 1-800-TAX-FORM (1-800-829-3676).

If you have questions, call 1-877-829-5500 between 8 a.m. and 5 p.m., local time, Monday through Friday (Alaska and Hawaii follow Pacific Time).

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CLEAN AIR CAROLINA
PO BOX 5311
CHARLOTTE NC 28299

Sincerely yours,

Kim A. Billups, Operations Manager
Accounts Management Operations 1